

What is claimed is;

1. A semiconductor laser device comprising:
a substrate, a semiconductor layer including an active
layer, a cladding layer, and a contact layer stacked in the
recited order;

two exposed portions having a depth at which said
semiconductor layer is exposed continuously from one of two
resonator end faces to the other; and

a ridge portion, formed between said two exposed
portions, which has a current injection window;

wherein in at least one of the resonator end faces of
said ridge portion, a portion of said contact layer near said
one resonator end face is removed;

an insulating film is formed so that it covers a region,
excluding said current injection window, of said contact layer,
and portions of said cladding layer exposed by removing the
portion of said contact layer near said one resonator end face;
and

an electrode is formed on at least a portion of said
contact layer exposed to said current injection window.

2. The semiconductor laser device as set forth in
claim 1, wherein the uppermost layer of said semiconductor layer
in a stacking direction is an etch-stopping layer, said cladding
layer is provided on said etch-stopping layer, and a layer
exposed to the bottom portions of said two exposed portions is
said etch-stopping layer.

3. The semiconductor laser device as set forth in claim 1, wherein said cladding layer comprises AlGaAs and said contact layer comprises GaAs.

4. The semiconductor laser device as set forth in claim 2, wherein said cladding layer comprises AlGaAs and said contact layer comprises GaAs.

5. The semiconductor laser device as set forth in claim 2, wherein said etch-stopping layer comprises InGaP.

6. The semiconductor laser device as set forth in claim 2, wherein said cladding layer comprises AlGaAs, said contact layer comprises GaAs, and said etch-stopping layer comprises InGaP.

7. The semiconductor laser device as set forth in claim 2, wherein another cladding layer is provided underneath said etch-stopping layer, is the same in conductivity and nearly the same in refractive index as said cladding layer, and has a lattice match with respect to said substrate.

8. The semiconductor laser device as set forth in claim 1, wherein a side face of said contact layer exposed to said exposed portion is situated inside an edge of a top surface of said cladding layer exposed to said exposed portion.

9. The semiconductor laser device as set forth in claim 1, wherein the portion of said contact layer near said resonator end face, which is removed, is in a range between 5 μm and 50 μm , from said one resonator end face.

10. A method of fabricating a semiconductor laser

device, comprising the steps of:

stacking a cladding layer and a contact layer on a semiconductor layer including an active layer, in the recited order;

5 forming a photoresist film, which has two windows extending from one of two resonator end faces to the other, on said contact layer through a mask, and then etching said cladding layer and said contact layer to form two grooves, corresponding to said two windows, and a ridge portion between said two grooves;

10 forming a window in at least a portion of said photoresist film near one of the two resonator end faces of said ridge portion through a mask, and then selectively etching and removing a portion of said contact layer which is near said one resonator end face; and

15 lifting off and removing said photoresist film.

11. The method as set forth in claim 10, wherein said cladding layer comprises AlGaAs, said contact layer comprises GaAs, and said contact layer is etched with an $\text{NH}_3\cdot\text{H}_2\text{O}_2$ mixed water solution.

20 12. A semiconductor laser device comprising:
two opposite resonator end faces where at least a first conduction type first cladding layer, a first conduction type or i-type first optical waveguide layer, an i-type $\text{In}_{x_2}\text{Ga}_{1-x_2}\text{As}_{1-y_2}\text{P}_{y_2}$ first barrier layer having tensile strain (where $x_2/0.49 \leq y_2 \leq 0.3 + (x_2/0.49)$, and $0.8 \leq y_2 \leq 1.0$), an i-type
25 $\text{In}_{x_3}\text{Ga}_{1-x_3}\text{As}_{1-y_3}\text{P}_y$ quantum well active layer (where $0.3 \leq x_3 \leq 0.2$

and $y_3 = x_3/0.49$), an i-type $\text{In}_{x_2}\text{Ga}_{1-x_2}\text{As}_{1-y_2}\text{P}_{y_2}$ second barrier layer having tensile strain (where $x_2/0.49 \leq y_2 \leq 0.3 + (x_2/0.49)$, and $0.8 \leq y_2 \leq 1.0$), a second conduction type or i-type second optical waveguide layer, a second conduction type second cladding layer, a second conduction type contact layer, are stacked on a first conduction type GaAs substrate in the recited order;

wherein said first cladding layer and said second cladding layer comprise compositions which have a lattice match with respect to said GaAs substrate, respectively;

said first optical waveguide layer and said second optical waveguide layer comprise compositions which have a lattice match with respect to said GaAs substrate, respectively;

the total thickness of said first barrier layer and said second barrier layer is between 10 nm and 30 nm;

said first barrier layer and said second barrier layer have tensile strains with respect to said GaAs substrate, respectively, and comprise a composition in which the product of a tensile strain quantity common to said two barrier layers and said total thickness is between 0.05 nm and 0.2 nm;

said quantum well active layer comprises a composition which has a lattice match with respect to said GaAs substrate or composition which has a tensile strain of ~ 0.007 with respect to said substrate; and

a current non-injection region is provided near at least one of said two opposite resonator end faces.

13. The semiconductor laser device as set forth in claim 12, wherein

said current non-injection region is formed by removing at least a portion of said contact layer that is near
5 said one resonator end face;

an insulating film is formed from the remaining contact layer on said second cladding layer to said second cladding layer exposed to said current non-injection region, a current injection window is formed by removing a portion of said insulating film to inject current; and

an electrode is formed on a portion of said insulating film other than said current non-injection region so that it covers at least said current injection window.

14. The semiconductor laser device as set forth in claim 12, wherein said contact layer comprises GaAs and said cladding layer has a composition that is not etched by an etchant for GaAs.

15. The semiconductor laser device as set forth in claim 13, wherein said contact layer comprises GaAs and said cladding layer has a composition that is not etched by an etchant for GaAs.

16. The semiconductor laser device as set forth in claim 12, wherein said current non-injection region is formed in a range between 5 μm and 50 μm , from said resonator end face.

17. A solid-state laser apparatus comprising:
an excitation light source; and

a solid-state laser crystal for emitting laser light
by being excited with excitation light emitted from said
excitation light source;

wherein said excitation light source comprises the
5 semiconductor laser device as set forth in claim 1 or 12.